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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/782,201	02/14/2001	Seiji Umemoto	Q63077	9861

7590 05/21/2004  
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EXAMINER

DUONG, TAI V

ART UNIT PAPER NUMBER

2871

DATE MAILED: 05/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/782,201

Applicant(s)

UMEMOTO ET AL.

Examiner

Tai Duong

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 March 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5, 7 and 8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7 and 8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☒ Other: **2 COPIES OF CLASS 349 SCHEDULE**

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In the telephonic conversation on January 12, 2004, the examiner confirmed with Ms. Ellen R. Smith that the Office action mailed 12/08/03 is non-final.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 4, 7 and 8 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Lu et al in view of Kuroda.

Lu et al disclose in Fig. 1 a LCD device similar to that of the instant claims comprising a visual side substrate 30 having a transparent electrode 36, a reflection cholesteric liquid crystal layer 38, a color-imparting layer 18 on a backside transparent resin substrate 12 having a transparent electrode 20 (col. 3, line 26 – col. 4, line 31). Thus, the only difference between the LCD device of Lu and that of the instant is a colored resin substrate being used in place of the color-imparting layer 18 and the transparent resin substrate 12. Kuroda discloses in Figs. 1 and 4 that it was known to employ a transparent substrate 2 with a light absorbing layer 5 or a colored resin substrate 12 having light absorbing function (col. 3, lines 10-22; col. 4, line 1 – col. 6, line 40; col. 7, lines 1-3). Thus, it would have been obvious to a person of ordinary skill in the art in view of Kuroda to employ a colored resin substrate, instead of the color imparting layer and the substrate, in Lu's device for reducing the thickness, the weight and the manufacturing cost of the LCD device (fewer elements as compared to the case

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of the color imparting layer and the substrate). As to claim 4, Lu et al disclose that it was known to employ a black layer for a high contrast ratio (col. 1, lines 40-42). Thus, it would be obvious to a person of ordinary skill in the art to employ a black colored substrate in the LCD cited in the above rejection for obtaining high contrast ratios.

Claim 3 and 5 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Lu et al and Kuroda as applied to claim 2 above, and further in view of Fukuchi et al.

Fukuchi et al disclose that it was known to employ a resin substrate not being thicker than 1 mm and having a glass transition of not lower than 90 °C for providing sufficient heat resistance during the required working process (col. 2, lines 49-59; col. 10, lines 23-30). Thus, it would have been obvious to a person of ordinary skill in the art in view of Fukuchi to select a resin substrate not being thicker than 1 mm as the colored resin substrate cited in the above rejection of claim 2 for obtaining a substrate with good mechanical characteristics and lightweight. Also, it would have been obvious to a person of ordinary skill in the art to select a resin substrate having a glass transition temperature not lower than the temperatures of the different steps of the process as the colored resin substrate cited in the above rejection of claim 2 for preventing damages to the resin substrate.

#### Response to Applicant's Remarks

Applicant's arguments filed 03/08/04 have been fully considered but they are not persuasive for the below reasons.

With respect to Applicant's remarks regarding the color-imparting layer 18 of Lu et al, Lu et al do disclose that "the color-imparting layer 18 may provide color by ... *dye in the layer ...*" (col. 3, lines 55-56). As is apparent to one of ordinary skill in the art, the dye has the function of absorbing light. As set forth in the last Office action, the Kuroda reference is relied upon in the rejection as an *evidence* to support for the examiner's position that it was known to employ either a *dual function* colored substrate having the functions of a substrate and a color filter or separate substrate and color filter. The concept of employing a dual function layer or element is *common* in the liquid crystal art. As an evidence, there is a subclass 162 of class 349 (liquid crystal class) which is particularly directed to the dual function layer or element. See attached copies of the definition of subclass 162 and the schedule of class 349 which has been established on December 1996. In addition, the function of the colored substrate of Kuroda is the *same* when employing in Lu's device, i.e. to provide colored light and support for the elements disposed on the substrate. Also, it is noted that for the painted layer the perception of color is obtained by the absorption of some of the wavelengths of the visible light *and* reflection of the remainder of the wavelengths (non absorbed light) of the visible light, except the black painted layer which absorbs all the wavelengths of the visible light. In addition, Lu et al do disclose that in the prior art the surface 14 of the substrate 12 has been painted *black to maximize absorption of light* incident thereon (col. 3, lines 46-48). Therefore, it would have been obvious to one of ordinary skill in the art to employ the colored substrate of Kuroda instead of the separate color-imparting layer and separate substrate in Lu's LCD device for reducing the thickness, the weight and the

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manufacturing cost of the LCD device. The same reasons are also applied to

Applicant's remarks regarding claim 2 and the dependent claims since these remarks have been based on those applied to claim 1.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication should be directed to Tai Duong at telephone number (571) 272-2291.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.



TVD

05/04

  
TOANTON  
PRIMARY EXAMINER

- (1) Note. Included here are spacers formed by etching or cutting out portions of the substrate and growing spacers on the substrate.

**157 Plural types in single liquid crystal cell:**

This subclass is indented under subclass 155. Subject matter wherein two or more different types of spacers are included in a single liquid crystal layer.

- (1) Note. Included here are combinations of hard and soft or adhesive and nonadhesive spacers.

**158 Substrate:**

This subclass is indented under subclass 84. Subject matter wherein the features of a liquid crystal supporting surface (i.e., substrate) are specifically identified.

**159 Fiberoptic faceplate:**

This subclass is indented under subclass 158. Subject matter wherein each surface of the substrate is formed from ends of multiple thin transparent fibers of plastic or glass waveguides bundled together side-by-side.

- (1) Note. Excluded from this subclass are fiberoptic plates used as part of the illumination system. For such excluded subject matter see, SEARCH THIS CLASS, SUBCLASS below.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 62, and 63, for the use of fiberoptic plates as part of the illumination system in a liquid crystal device.

**160 With particular topology (i.e., other than for diffraction and spacers):**

This subclass is indented under subclass 158. Subject matter wherein a surface of the substrate is nonplanar, but wherein the nonplanar surface is not used for diffraction or as a liquid crystal spacer.

- (1) Note. Included here are curved or roughened surfaces.

- (2) Note. The nonplanar surface is not used for diffraction or as a liquid crystal spacer.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 156, for spacers formed integrally with the substrate.  
201, for a diffraction grating using a liquid crystal.

**161 Heating or cooling element other than for exciting:**

This subclass is indented under subclass 84. Subject matter wherein a structure is employed for maintaining the liquid crystal material at a particular temperature either by increasing or decreasing the liquid crystal temperature.

- (1) Note. Included here are thermal conduction elements.

**162 Dual function layer or element:**

This subclass is indented under subclass 84. Subject matter wherein two or more elements or layers have been combined as a single element or layer having the functions of all of the original elements or layers.

- (1) Note. Included here are polarizers used as substrates, reflectors used as electrodes, color filters used as alignment layers, and electrodes used as antireflection layers.

**163 Nonchiral additive in the liquid crystal material:**

This subclass is indented under subclass 84. Subject matter wherein a material is added to the liquid crystal material other than for promoting a twist of the liquid crystal molecules.

- (1) Note. Included here are additives which selectively absorb light under certain conditions and additives which align with electric or magnetic fields applied to the liquid crystal.

**164 Fluorescent additive:**

This subclass is indented under subclass 163. Subject matter wherein the liquid crystal is mixed with a substance which fluoresces.

- 156 ... Formed as walls (e.g., between pixels) or integral with substrate
- 157 ... Plural types in single liquid crystal cell
- 158 ... Substrate
- 159 ... Fiberoptic faceplate
- 160 ... With particular topology (i.e., other than for diffraction and spacers)
- 161 ... Heating or cooling element other than for exciting
- 162 ... Dual function layer or element
- 163 ... Nonchiral additive in the liquid crystal material
- 164 ... Fluorescent additive
- 165 ... Pleochroic dye
- 166 ... Nonspacer particles significantly smaller than liquid crystal thickness (e.g., scattering centers, ferromagnetic particles, etc.)
- 167 **WITH SPECIFIED NONCHEMICAL CHARACTERISTIC OF LIQUID CRYSTAL MATERIAL**
- 168 ... Utilizing change between diverse phases (e.g., cholesteric to nematic)
- 169 ... Utilizing change within liquid crystal phase (e.g., Grandjean to focal conic, etc.)
- 170 ... Utilizing reversal in sign of dielectric anisotropy
- 171 ... Within smectic phase
- 172 ... Within chiral smectic phase (includes ferroelectric)
- 173 ... Greyscale resulting from liquid crystal property other than solely Smectic A
- 174 ... Antiferroelectric
- 175 ... Within cholesteric phase
- 176 ... Using reflection characteristic
- 177 ... Within nematic phase
- 178 ... Negative dielectric anisotropy only
- 179 ... Twisted (or chiral) nematic or supertwisted nematic
- 180 ... Having particular parameter of twist
- 181 ... Having particular birefringence or retardation
- 182 **CELL CONTAINING LIQUID CRYSTAL OF SPECIFIC COMPOSITION**
- 183 ... Polymer liquid crystal
- 184 ... In smectic phase
- 185 ... In cholesteric phase
- 186 ... In nematic phase
- 187 **NOMINAL MANUFACTURING METHODS OR POST MANUFACTURING PROCESSING OF LIQUID CRYSTAL CELL**
- 188 ... Changing liquid crystal phase
- 189 ... Injecting liquid crystal
- 190 ... Sealing of liquid crystal
- 191 ... Aligning liquid crystal with means other than alignment layer
- 192 ... Defect correction or compensation
- 193 **LIQUID CRYSTAL OPTICAL ELEMENT**
- 194 ... Passive liquid crystal polarizer
- 195 ... Antidazzle mirror formed from liquid crystal cell
- 196 ... Beam dividing switch formed from liquid crystal cell
- 197 ... Including passive liquid crystal switch portion
- 198 ... Liquid crystal etalon
- 199 ... Liquid crystal sensors (e.g., voltmeters, pressure sensors, temperature sensors)
- 200 ... Liquid crystal lenses other than for eyewear
- 201 ... Liquid crystal diffraction element
- 202 ... For beam steering
- FOREIGN ART COLLECTIONS**
- FOR ... **CLASS-RELATED FOREIGN DOCUMENTS UTILIZING A LIQUID CRYSTAL MATERIAL (359/36)**
- FOR 100 ... With particular illumination (359/48)
- FOR 101 ... Having optical element (e.g., curved reflector behind light source, etc.) (359/49)
- FOR 102 ... Fluorescent light (e.g., FLAD type) (359/50)
- FOR 103 ... Microencapsulated liquid crystal (359/51)
- FOR 104 ... With particular encapsulating medium (359/52)
- FOR 105 ... Plural contiguous cells (359/53)
- FOR 106 ... Having electrodes arranged into rows and columns (359/54)
- FOR 107 ... With liquid crystal electrode excitation (359/55)